(c) Determine whether P and Q collide. [2]

11 Given that $\frac{{}^{n+1}\mathrm{P}_5}{437} = {}^{n}\mathrm{P}_3$, use an algebraic method to find the value of n. [4]

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12 The function f is defined by $f(x) = 15\cos^2(3x+1.5) + 7\sin(3x+1.5) - 13$ for $-0.3 \leqslant x \leqslant 0.5$, where x is in radians.

(a) Solve the equation $f(x) = 0$. [5]

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